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Daffodil International University

Faculty of Science and Information Technology
Department of CSE
Midterm Examination, Semester: Fall 2022
Course Code: CSE 411 Course Title: Computer Architecture & Organization
Section: All

Time: 01:30H **[Answer all the Questions. Obtain marks in the right-side]** **Full marks: 25**

Throughout history humans have relied mainly on their brains to perform calculation. As civilization advanced, a variety of computing tools were invented that aided. Calculating machines capable of performing the elementary operations of arithmetic (addition, subtraction, multiplication and division) appeared in the 16th century. Initially computers are mechanical and then it focusing on electronic computers, as mechanical computers have some drawbacks. One of the First-Generation Computers built at the University of Pennsylvania. Others are developed at Institute for Advanced Studies in Princeton which have two key aspects. The Third Generation allowed large numbers of transistor associated components to be combined on a tiny piece of semiconductor material, usually silicon. There is different level in the design methodology of a computing system. Which play deferent role in computing system designing. Popular lower-level components are gates and flip-flops.

N.B. *Questions 1 (a, b, c) and question 2 (i, ii) are relevant with this scenario.*

1.	a.	**Define** the thought process of **Human brain** and **Computer System**.	[2]	CO1
	b.	**List** the **key aspects** of the computer developed in University of Pennsylvania.	[2]	
	c.	**Recall** first widely known **general purpose** electronic computer with its **features** and supported by relative **architecture**.	[4]	
2.	i.	**Explain** the performance differences of **low-level components** mentioned in the scenario.	[2]	CO2
	ii.	**Illustrate** the major performance **unit** of **processor level** computer system with the **activity** they perform, supported by their relevant **architecture**.	[5]	
	iii.	Suppose you have a Hexadecimal number as: **3A8**, now convert this number to Binary. **Unsigned** and **Signed** number system.	[2]	
	iv.	**Demonstrate Half-Adder** Circuit by using only NOR Gate.	[3]	
3.	a.	Construct diffferentiation between **fixed length** and **variable langth** instruction set design with proper statemares and examples. **Unsigned** and **Signed** number system.	[2]	CO3
	b.	Suppose you have **4 instructions,** now **develop** the general execution of these instructions and then find some **effective way** to **increase throughput of** the system.	[3]	